

WHAT IS CLAIMED IS:

1. A composition for reducing the content of NO_x and gas phase reduced nitrogen species during catalyst regeneration in a fluid catalytic cracking (FCC) process, said composition comprising particles having a mean particle size of about 50 to about 200 μ m and comprising (i) at least about 5.0 wt % of acidic metal oxide containing substantially no zeolite; (ii) a metal component selected from the group consisting of alkali metal, alkaline earth metal, and mixtures thereof; (iii) at least 0.1 wt %, measured as metal oxide, of an oxygen storage metal oxide; and (iv) at least 0.1 ppm of a noble metal component selected from the group consisting of platinum, iridium, sodium, osmium, ruthenium, rhenium and mixtures thereof, said metal component (ii) being present in amount of at least 0.5 wt %, measured as metal oxide, of the composition.
2. The composition of Claim 1 wherein the acidic metal oxide is selected from the group consisting of alumina, silica alumina, lanthana alumina and zirconia alumina.
3. The composition of Claim 2 wherein the said acidic metal oxide is silica alumina.
4. The composition of Claim 1 wherein the acidic metal oxide further comprises at least one stabilizing metal oxide.
5. The composition of Claim 4 wherein the stabilizing metal oxide is selected from the group consisting of yttria, neodymia, samaria, europia, gadolinia and mixtures thereof.
6. The composition of Claim 1 wherein the component (ii) is alkali metal.
7. The composition of Claim 6 wherein said alkali metal is selected from the group consisting of sodium, potassium, cesium, lithium and mixtures thereof.

8. The composition of Claim 7 wherein the alkali metal is sodium or potassium.
9. The composition of Claim 8 wherein the alkali metal is sodium.
10. The composition of Claim 1 wherein component (ii) contains an alkaline earth metal.
11. The composition of Claim 10 wherein the alkaline earth metal is selected from the group consisting of magnesium, calcium barium, strontium and mixtures thereof.
12. The composition of Claim 11 wherein the alkaline earth metal is magnesium.
13. The composition of Claim 1 wherein the oxygen storage component (iii) is a rare earth metal oxide having oxygen storage capability, a transition metal oxide having oxygen storage capability, and mixtures thereof.
14. The composition of Claim 13 wherein the oxygen storage component (iii) is a rare earth metal oxide having oxygen storage capability.
15. The composition of Claim 14 wherein the rare earth metal oxide is selected from the group of ceria, samaria, praseodymia, europia, terbia and mixtures thereof.
16. The composition of Claim 13 wherein the oxygen storage component (iii) is a transition metal oxide having oxygen storage capability.
17. The composition of the above Claim 16 wherein the transition metal oxide is selected from the group consisting of vanadium, manganese oxide, iron oxide, nickel oxide, copper oxide, cobalt oxide, chromia, titania, silver oxide, molybdenia, niobia, gold oxide, tungsten oxide, and mixtures thereof.

18. The composition of Claim 15 wherein at least a portion of the rare earth metal oxide comprise ceria.
19. The composition of Claim 18 wherein the rare earth metal oxide consists essentially of ceria.
20. The composition of Claim 13 wherein the oxygen storage metal oxide component (iii) further comprises at least one stabilizing metal oxide.
21. The composition of Claim 21 wherein the stabilizing metal oxide is selected from the group consisting of zirconia, lanthana, neodymia, gadolinia, yttria, scandia, hafnia, and mixtures thereof.
22. The composition of Claim 1 wherein the noble metal component is selected from the group consisting of platinum, iridium, rhodium, osmium, ruthenium, rhenium and mixtures thereof.
23. The composition of Claim 22 wherein the noble metal component is selected from the group consisting of platinum, rhodium, iridium and mixtures thereof.
24. A fluid cracking catalyst comprising (a) a cracking component suitable for catalyzing the cracking of hydrocarbons, and (b) the composition of claim 1.
25. The cracking catalyst of Claim 24 wherein said cracking catalyst comprises an admixture of components (a) and (b).
26. The cracking catalyst of Claim 24 wherein said catalyst comprises integral particles which contain both components (a) and (b).
27. The cracking catalyst of Claim 24 wherein component (b) comprises at least 0.01 wt % of the cracking catalyst.

28. A method of reducing gas phase reduced nitrogen species emissions from the regeneration zone during fluid catalytic cracking of a hydrocarbon feedstock into lower molecular weight components, said method comprising contacting a hydrocarbon feedstock with a cracking catalyst at elevated temperature whereby lower molecular weight hydrocarbon components are formed, said cracking catalyst comprising (a) a cracking component suitable for catalyzing the cracking of hydrocarbons, and (b) the composition of claim 1.

29. The method of Claim 28 further comprising recovering the cracking catalyst from said contacting step and treating the used catalyst in a regeneration zone to regenerate said catalyst.

30. The method of Claim 29 wherein the regeneration zone is operated in a partial mode of combustion.

31. The method of Claim 28 wherein components (a) and component (b) are fluidized during contacting said hydrocarbon feedstock.

32. The method of Claim 29 wherein the regeneration zone is operated in incomplete mode combustion.

33. A method of reducing NO_x emissions from the regeneration zone during fluid catalytic cracking of a hydrocarbon feedstock into lower molecular weight components, said method comprising contacting a hydrocarbon feedstock with a cracking catalyst at elevated temperature whereby lower molecular weight hydrocarbon components are formed, said cracking catalyst comprising (a) a cracking component suitable for catalyzing the cracking of hydrocarbons, and (b) the composition of claim 1.

34. The method of Claim 33 further comprising recovering the cracking catalyst from said contacting step and treating the used catalyst in a regeneration zone to regenerate said catalyst.

35. The method of Claim 34 wherein the regeneration zone is operated in a partial mode of combustion.

36. The method of Claim 33 wherein components (a) and component (b) are fluidized during contacting said hydrocarbon feedstock.

37. The method of Claim 34 wherein the regeneration zone is operated in an incomplete mode of combustion.